Executive Summary

DRAFT FSIS Comparative Risk Assessment for *Listeria monocytogenes* in Ready-to-eat Meat and Poultry Deli Meats

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BACKGROUND

Listeria monocytogenes (*L. monocytogenes*) is an important foodborne pathogen, estimated to cause approximately 2,500 illnesses, 2,300 hospitalizations, and 500 deaths each year in the United States. In an effort to understand better the sources of foodborne *Listeria* infection, the Food and Drug Administration (FDA) and the Food Safety Inspection Service (FSIS), working collaboratively, developed a quantitative risk assessment for *L. monocytogenes* that compared the risk of listeriosis among twenty-three categories of ready-to-eat (RTE) foods. The results of the risk assessment, completed in 2003, indicated deli meats pose the greatest risk for listeriosis, accounting for approximately 1,600 illnesses per year.

Based on these findings, FDA and FSIS conducted a preliminary analysis using the 2003 *L. monocytogenes* risk assessment to evaluate the relative risk of illness from *Listeria* on deli meat sliced and packaged at federally-inspected processing establishments (prepackaged deli meat) compared to deli meat sliced at retail facilities. This risk assessment contained industry data for *L. monocytogenes* on retail deli meat from delicatessens in California and Maryland (Gombas et al. 2003). The results of this risk assessment indicated a high percentage of listeriosis cases related to deli meats were associated with those sliced at retail. Because these results, however, were based on limited retail *L. monocytogenes* contamination data for deli meats, FSIS sought to gather additional data specifically to examine the relative risk of illness from prepackaged deli meat compared to deli meat sliced at retail facilities more closely.

Therefore, the U.S. Department of Agriculture, Agricultural Research Service funded the National Alliance for Food Safety and Security (NAFSS) – a consortium of twenty-five research universities – to conduct a four-state study in which prepackaged deli meat and deli meat sliced and packaged at retail were analyzed for the prevalence and level of *L. monocytogenes* (Draughon 2006).

METHODS

Data from the NAFSS study, described in Appendix I of the risk assessment report, were used as inputs to the deli meat exposure pathway developed as part of the abovementioned 2003 FDA-FSIS risk assessment for *Listeria* in ready-to-eat foods. The pathway consists of four distinct stages. The *Retail Stage* determines the level of *L. monocytogenes* in prepackaged deli meats and in deli meats sliced at retail. The G*rowth Stage* uses an exponential growth rate function to model growth of *L. monocytogenes* in deli meat between purchase at retail and consumption. The *Consumption Stage* uses information about deli meat serving sizes and the number of servings consumed to estimate consumer exposure to *L. monocytogenes* in deli meat. Lastly, by integrating the predicted exposure with a dose-response relationship, the *Dose-response Stage* predicts the probability of death from consuming *L. monocytogenes* on deli meat.

Two distinct consumer storage time-temperature distributions were used for the risk assessment. The first analysis used the same storage time-temperature distributions as the 2003 FDA-FSIS risk assessment. The storage times were taken from an American Meat Institute (AMI) 2001 survey and consumer storage temperatures were taken from an Audits International 1999 survey. For this first analysis, the storage times for both prepackaged deli meat and deli meat sliced at retail used the same values. A second analysis, described in Appendix II, was performed using the consumer survey conducted by RTI International, Tennessee State University, and Kansas State University (Cates et al. 2006). The results of the survey indicated prepackaged deli meat was stored for statistically significant longer periods than deli meat sliced at retail. The survey did not find any difference for storage temperature. This second analysis thus used different storage time distributions for prepackaged versus retail sliced product.

RESULTS

This risk assessment, using current retail contamination data for deli meat (Draughon 2006; NAFSS) and current consumer behavior data for deli meats (Cates et al. 2006; RTI) indicates that of those listeriosis cases and deaths attributed to deli meats, approximately 83% are associated with deli meats sliced at retail. The estimated mean number of illnesses per year from prepackaged deli meats was 188.6 with a 95% confidence interval (CI) of 184.7 – 192.4. The estimated mean number of deaths per year from *L. monocytogenes* prepackaged deli meats was 34.1 (95% CI: 33.4 – 34.9). In contrast, the estimated mean number of illnesses per year from retail-sliced deli meats was 919.6 (95 CI: 686.4 – 932.4). The estimated mean number of deaths per year from *L. monocytogenes* in retail-sliced deli meats was 166.9 (95% CI: 164.5 – 169.3).

CONCLUSIONS

Of those illnesses and deaths from *L. monocytogenes* from deli meat consumption, a large percentage is attributed to deli meat sliced at retail facilities. The remainder is from prepackaged deli meat. Studies are needed to determine how contamination of deli meat at retail occurs and to design effective mitigations for reducing listeriosis associated with the consumption of deli meat sliced at retail.